

Solid-State Ceramic Laser Material for Remote Sensing of Ozone Using Nd:Yttria, Phase II

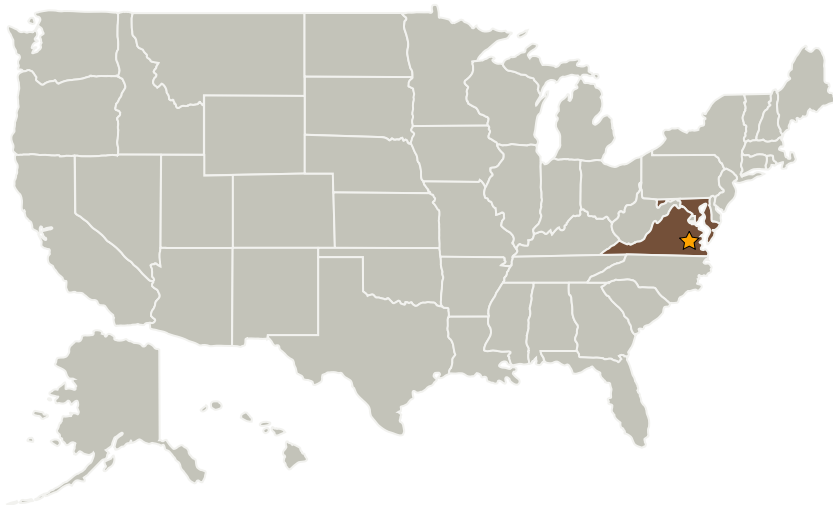
Completed Technology Project (2005 - 2007)



Project Introduction

In Phase II we will develop transparent Nd:Yttria ceramic laser materials that can operate at 914 nm and 946 nm suitable for applications in ozone LIDAR systems. We will strive to further optimize Nd:Yttria ceramics with a focus on improving the overall transmission of the material as well as optimizing the Nd dopant concentration. The goal is to develop Nd: Yttria laser materials with high figure-of-merit (FOM) that do not suffer from Nd concentration quenching. We will investigate Nd:Yttria ceramics as solid-state laser materials. Initial testing will be done at the primary emission wavelength of 1.07 μ m. Laser performance studies will be based on pulsed, quasi-cw, and cw end-pumping schemes. We will also develop the Nd: Y2O3 ceramics for laser applications at 914 nm and 946 nm. The optimized ceramic materials developed will be used for laser experiments at 914nm and 946nm. Initial experiments will be carried out at reduced temperature (77K). After successful demonstration of low-temperature lasing at 914nm/946nm, the possibility of efficient lasing at higher temperatures (up to 300K) will be explored. Different laser designs will be employed including end-pumping schemes and the thin-disk laser configuration.

Primary U.S. Work Locations and Key Partners



Solid-State Ceramic Laser Material for Remote Sensing of Ozone Using Nd:Yttria, Phase II

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Solid-State Ceramic Laser Material for Remote Sensing of Ozone Using Nd:Yttria, Phase II

Completed Technology Project (2005 - 2007)



Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Brimrose Corporation of America	Supporting Organization	Industry	Sparks, Maryland

Primary U.S. Work Locations

Maryland	Virginia
----------	----------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.5 Lasers